

# THE TICHATECH PROJECT

A NEW EDUCATION EXPERIENCE

ICT TRAINING: 28<sup>TH</sup> AUG 2023



THE TICHATECH PROJECT

—A NEW EDUCATION EXPERIENCE—

PCEA KIMURI PRIMARY SCHOOL

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# WHAT IS ICT?

**Information and Communication Technology (ICT) is a technology used to convert, store, protect, process, transmit, and retrieve information from anywhere, anytime. ICT in particular entails to the use of electronic computers, communication devices and software applications to process information.**

## **Information**

**Information refers to knowledge obtained from reading, investigation, study or research.**

**Information is processed data.**

## **Communication.**

**Communication refers to an act of transmitting messages. It is a process whereby information is exchanged between individuals, using symbols, signs or verbal interactions.**

## **Technology**

**Technology is the use of specific knowledge, experience and resources to create process and products that fulfill human needs.**

# Functions of ICT

The following are the four main functions of ICT

- 1. *Communication*** - this is the main function of ICT. It is helpful in communicating with other people no matter where the location is.
- 2. *Data Management*** - through ICT, data nowadays can be managed easily.  
Gone are the days when it was difficult to do data management
- 3. *Marketing*** - businesses and corporations make use of ICT in endorsing and selling their products
- 4. *Process Improvement*** - ICT helps in improving various processes

## Why ICT in Education

The growing use of technology in today's world is pushing teachers and other stakeholders in the education sector to consider integration of ICT into teaching and learning. The advantages of the integration include:

- Access to global learning resources and information
- Making learning interesting and enjoyable
- Uniform quality of communication
- Enhances the modes of learning
- Eco-friendliness, reduces the use of paper
- Easy student management
- Teachers can enhance the teaching experience by using images, videos and graphics when teaching
- Educators can create engaging, interesting and well-designed classroom activities
- Automation of different day to day activities at different activities

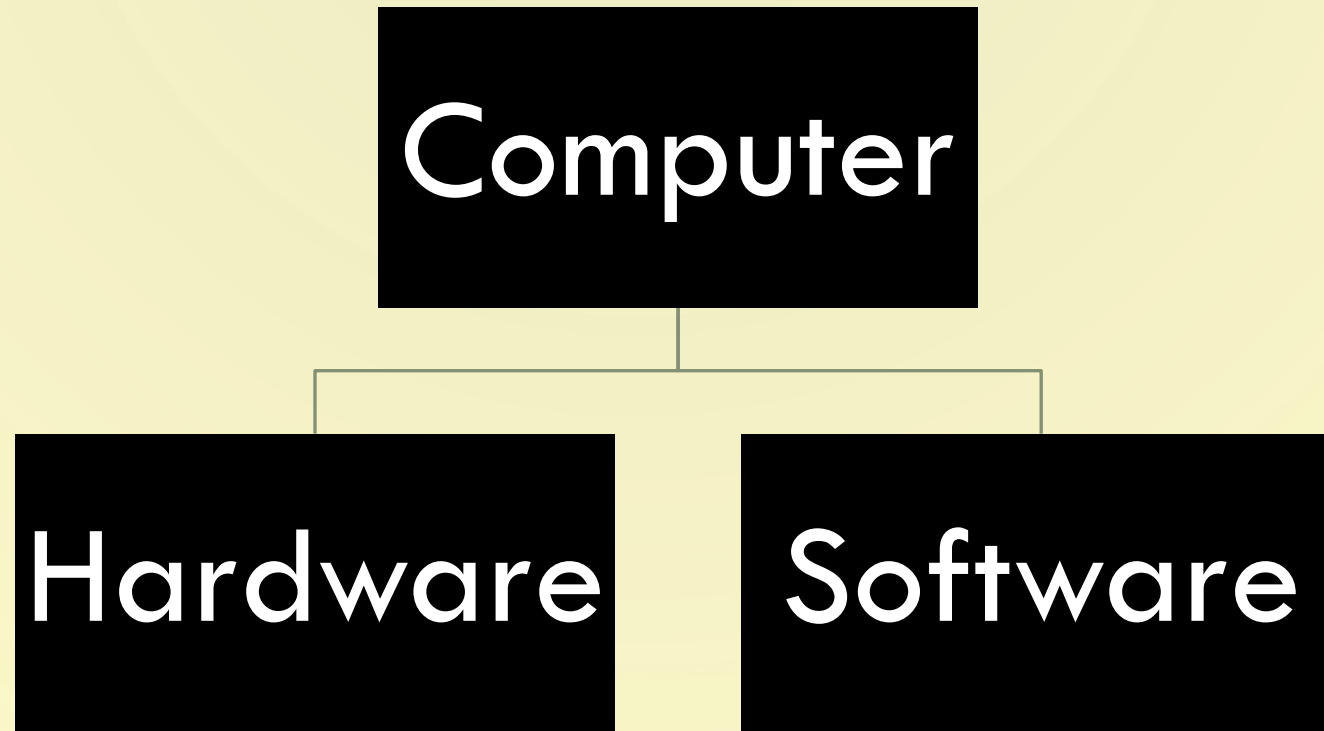
## Challenges facing the integration of ICT into Education

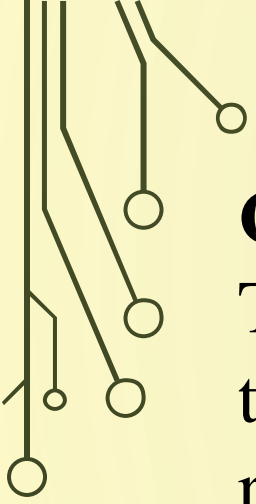
- Cost of implementation and maintenance of ICT technologies
- Reluctance to use ICT
- Little access to computer literacy for teachers
- Inadequate ICT facilities
- Lack of internet connection and access
- Outdated learning methods and curriculum
- Security of systems and data

## Computer System

A computer is an electronic device that accepts data as input and transforms it under the influence of set of instructions called programs to produce desired output referred to as information.

The computer mainly consists of hardware and software components. Both of these work together to process data.



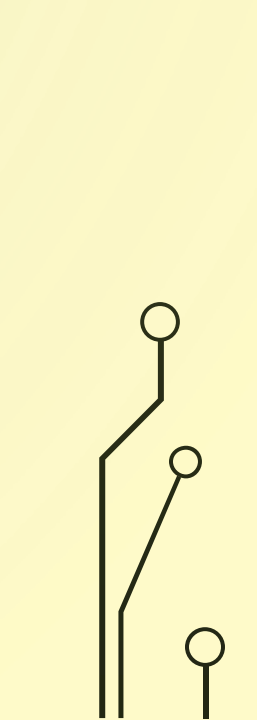
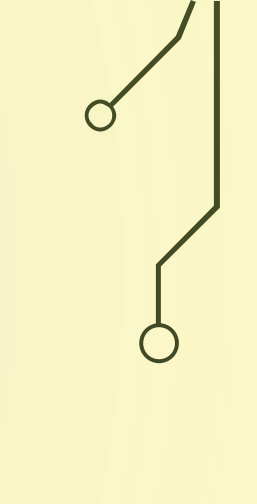



## **Computer Hardware**

The physical components of the computer that can be seen and touched are called as hardware. The term hardware is used to refer to all the components inside or outside the computer. In addition to this, components used to interconnect two or more components, for example, wires are also regarded as hardware.

## **Computer Software**

The sets of instructions that instruct the computer to do different tasks are called as software. For example, word processing, games, painting, e-mail, spreadsheets etc. Software is the driving force behind the working of computer



## Characteristics of a Computer

There are attributes that make a computer widely accepted and used in the day-to-day activities in our society. The attributes include:


1. **Speed:** A computer operates at very high speeds and can perform many functions within a short period of time.
2. **Accuracy:** Computers are very accurate, i.e., they never make mistakes. However, they are not exempted from GiGo (Garbage in Garbage out)
3. **Reliability:** The computer can be relied upon to produce correct answer if given the correct instructions and supplied with the correct data.
4. **Consistency:** Given the same data and the same instructions, they will produce the same answer every time that particular process is repeated.
5. **Storage:** A computer is capable of storing large amounts of data and instructions in a very small space
6. **Diligence:** Unlike humans a computer can work continuously without ever getting tired or bored
7. **Automation:** Once given instructions, the computer is guided b these instructions, it can carry on its job automatically until it is completed
8. **Versatile:** A computer can be used in different places to perform a large number of different jobs depending on instructions fed to it.



## Advantages of using a computer

1. Computers are reliable
2. Computers can store massive amounts of data
3. Computers facilitate the effective and efficient sharing of data
4. Data can be easily collected
5. Data can be processed with great speeds to produce useful information
6. Data can be manipulated over and over again with ease
7. Computers can perform calculations quickly and with great accuracy
8. Output can be produced in different usable formats.

## Limitations of computers

1. Computers can't think or rely on themselves
  2. Computers are not creative or imaginative
  3. Computers are unquestioning devices they don't understand ethics.
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# Hardware Components

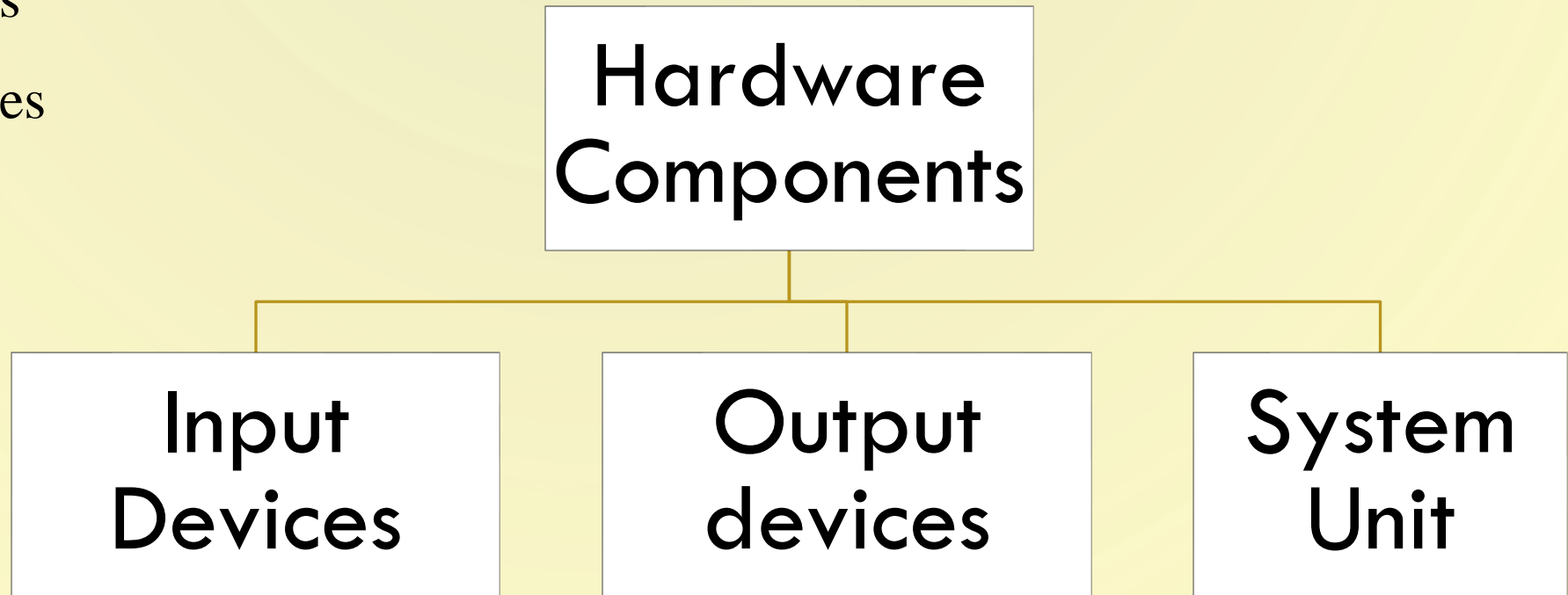
Hardware Components consists of all the machinery and equipment in a computer system. The hardware includes, the keyboard, the monitor, the printer, etc.

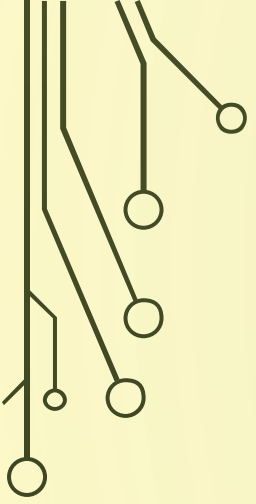
Hardware components include:

Input Devices

Output devices

System Unit



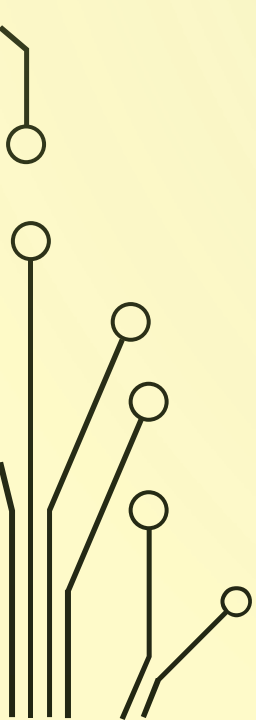
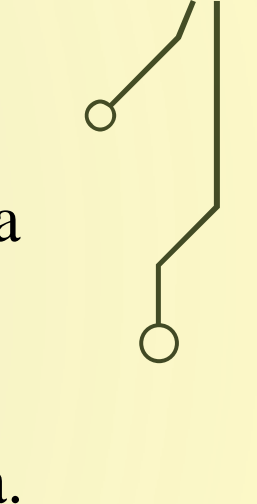
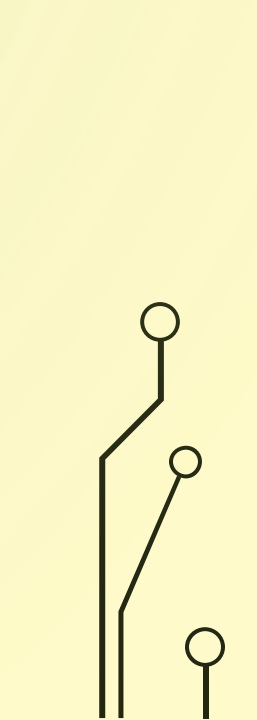


## Input devices

These are devices used to enter/put data into the computer. They accept data and convert it into a suitable form that the computer can understand.

Input devices are classified according to how they are used to enter the data.

They include

- Keying devices e.g., Keyboards, Keypads
  - Pointing devices e.g., mouse, trackball, joystick
  - Scanning devices e.g., Scanner, barcode reader
  - Speech recognition e.g., microphone
  - Touch devices e.g. Touch screen, smart boards.
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## Output Devices

Output devices are used to give the end result of data that was entered into the computer.

There are basically two types of output devices Softcopy output devices and hardcopy output devices.

Softcopy output devices:

They are devices that produce intangible output. they include speakers, monitors, projectors among others.

Hard copy output devices These are devices that produce tangible output mainly on paper. They include printers, plotters among others.

## System Unit

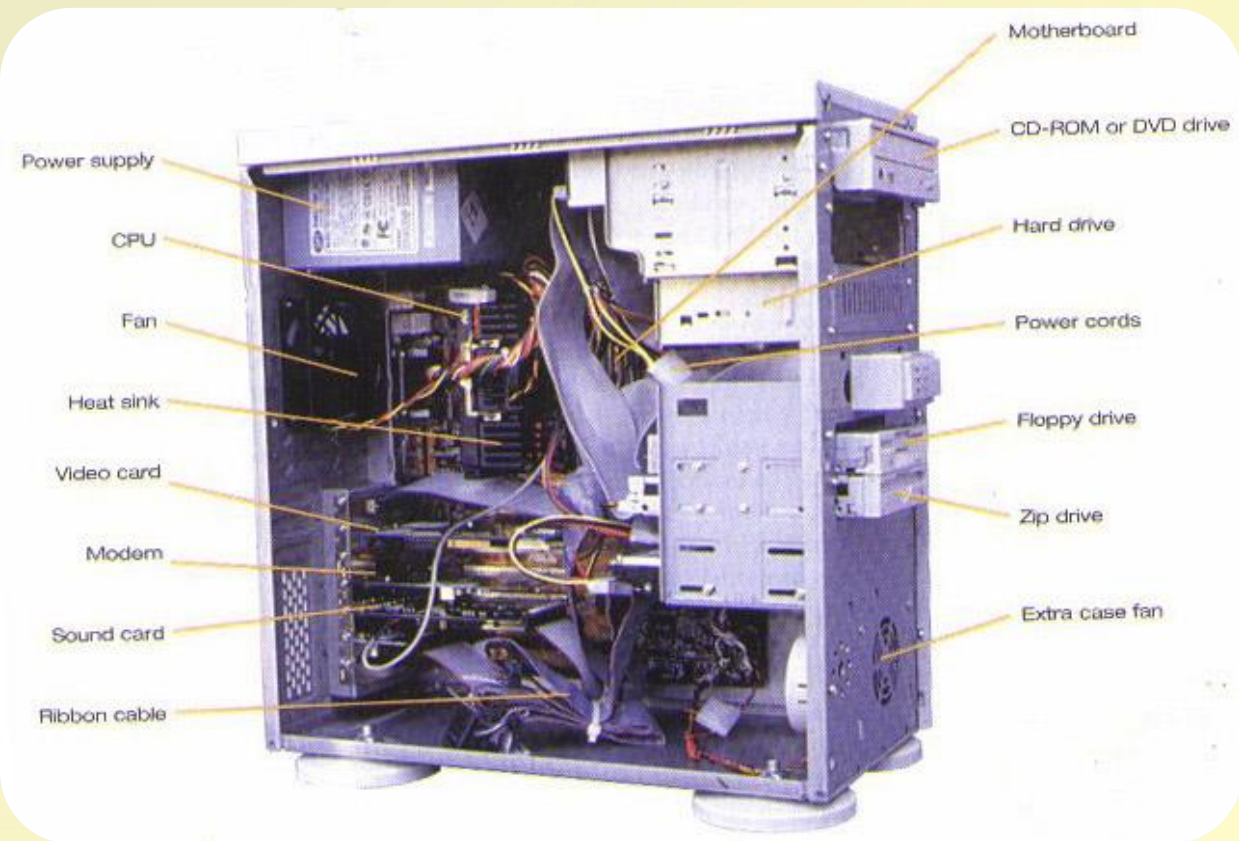
This is the casing or unit that houses the electronic components of the computer that are involved in the processes and operation of the computer.

The components in the system unit include:

- Processors (Central processing Unit)
- Motherboard
- Power Supply unit
- Memory Storage Units
- Disk Drives
- Ports

Features of the system Unit

- It houses the Processor
- It has the computers power switch
- It connects to all peripheral devices using ports



# THE CENTRAL PROCESSING UNIT (CPU)

This is the brain of the computer, and carries out all the processing within the computer.

- It is also referred to as the Processor.
- It is the brain of the computer and carries out all the processing.
- It is mounted on a circuit board called mother board (system board)

## Parts of CPU

- i) Control unit
- ii) Arithmetic logic unit(A.L.U)
- iii) Main memory(MM)
- iv) Auxiliary processors (AP)

### i) Control Unit (CU)

□ It coordinates all processing activities in the C.P.U well as input, output and storage operations

### Functions of the control unit

1. Directs the flow of information in the C.P.U, main memory and storage media.
2. Control the instructions the C.P.U will perform next.

## ii) Main Memory (Primary Storage)

- Provides storage location for data and instructions accessed by the control unit.

Primary memory is the memory that is closely associated with the operation of the CPU is also called main memory.

### Functions of the main memory

1. Holds data awaiting processing
2. Holds data that has been processed awaiting to be output
3. Holds data being processed

**NB:** Computer memory can be classified into:

- i) Read Only Memory (ROM)
- ii) Random Access Memory (RAM)

## iii) Arithmetic Logic Unit (ALU)

- It carries out all the arithmetic and logical operations of the CPU
- The basic arithmetic operations include: addition, subtraction, multiplication and division.
- Logical operations include: equal to, not equal to, less than, greater than etc.

### Functions of ALU

- i) Carries out all the mathematical computations in the computer
- ii) Carries out all the logical comparison of values

## TYPES OF MEMORY

There are two types of memory:

1. RAM (Random Access Memory)
2. ROM (Read Only Memory)

### 1. RANDOM ACCESS MEMORY

- It is most common type of main memory
- It is called random access memory because its content can be read directly regardless of the sequences in which it is stored.

NB: The content in RAM is held temporarily and therefore, the content is lost once the computer is turned off.

### Characteristics of RAM

1. Data can be read (retrieved/ opened) & written (stored) in it.
2. It is volatile (temporary) storage because its content is lost when the power is switched off.
3. Its content is user defined i.e. the user dictates what is to be contained in RAM.

### 1. READ ONLY MEMORY

- It is used to store programmed instructions/ data permanently or semi permanently.
- Data and instructions stored in Rom are those required unchanged for a very long time e.g. booting instructions, computerized fuel pump instructions etc.

### Characteristics of ROM

1. Can only be read but cannot be written on it unless it is a special type of ROM
2. It is non-volatile i.e. its content is not lost when the computer is switched off
3. Stores permanent instructions from the manufacturer

## Types of Computers

Computers can be classified on the basis of the following:

1. Size
2. Cost
3. Performance
  - (i) Speed of processing data
  - (ii) Storage capacity
  - (iii) Ability to handle input and output devices

### 1. Supercomputers

Super computers are the largest and fastest computers. They are also the costliest computers. They are used in fields like science and defense. These computers are used for designing and launching missiles, weather forecasting, biomedical research, aircraft design and automobile design.

### 2. Mainframe computers

Mainframe computers are more powerful than minicomputers. They have high processing speeds and can store large amounts of data. They are used in wide area networks and support hundreds of users.

### 3. Minicomputers

Minicomputers are small general-purpose computers, also called midrange servers. These computers can perform more complex tasks and cost more than microcomputers. They are used for processing data and analyzing results of experiments. They are also used for controlling and monitoring production processes

### 4. Microcomputers (personal computers)

Microcomputers are also called Personal Computers. These computers use microprocessors, they are small in size and the most popular types of computers and individuals and organizations use them.

## Type of personal computers

Personal computers include:

1. **Desktop computers** – required when processing power is more important than having a portable computer. It consists of a system unit, monitor, keyboard and mouse. Mainly used in an office or home.
2. **Note book or laptop computer** – is small, lightweight computer that incorporates a system unit, screen, keyboard and touchpad (mouse) in a single portable unit. Can be powered by either electrical power or in built-in battery. They are ideal for mobile use.
3. **Tablet PC** is a notebook or slate shaped mobile computer with a touch-sensitive screen that allows the user to operate it with stylus or handwriting recognition instead of a keyboard and mouse.
4. **Smartphone** is a cellular telephone with an integrated computer and other features not originally associated with telephones such as an operating system (OS), web browsing and ability to run software applications

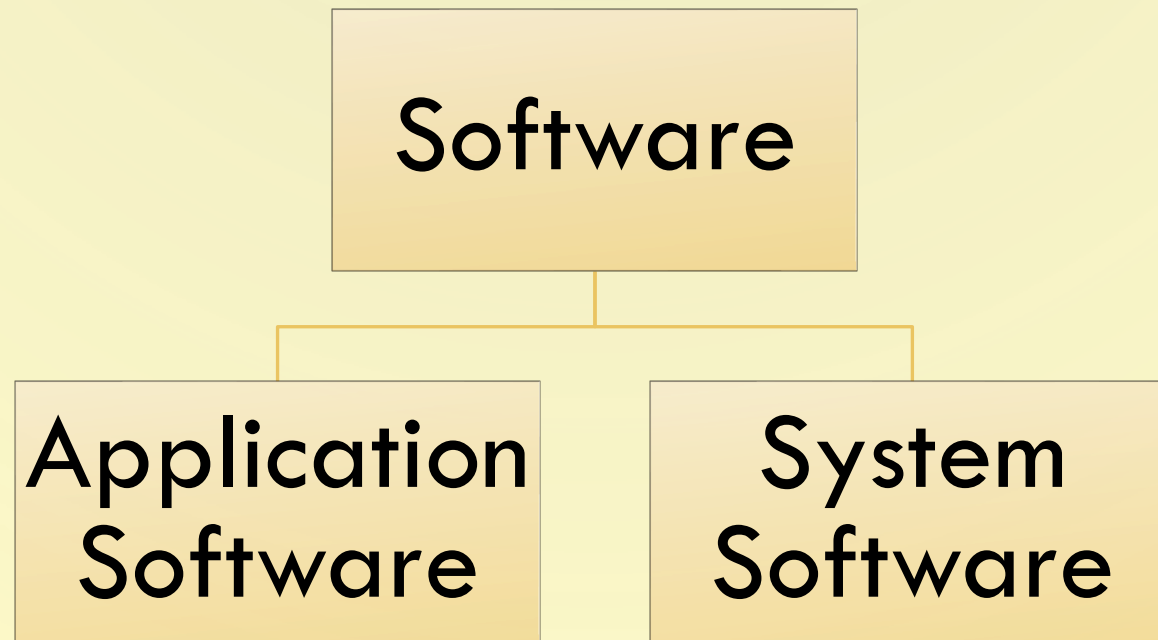
## Main Components of a personal Computer

|                     |   |
|---------------------|---|
| <b>System unit</b>  | Is the case within which you will find the CPU, motherboard, expansion cards, storage and power supply  |
| <b>Main memory</b>  | Refers to chips that stores the instruction the computer need to boot up (ROM) and the instruction and data used while the work is being performed(RAM )                                  |
| <b>Monitor</b>      | Is the screen on which information is displayed and thus a primary output of device connected to the system   |
| <b>Keyboard</b>     | Is a primary input device consisting of number of keys organized according to old typewriter conventions  |
| <b>Mouse</b>        | Is a pointing device used to perform input functions such as click processing options or selecting text or other object using the graphical user interface (GUI). Notebook has touch pads |
| <b>Storage</b>      | It is located within system unit and has a small external light indicating whether is busy reading or writing. It stores programs and data  |
| <b>Sound card</b>   | Is required for playing high –quality music and sounds  |
| <b>Speakers</b>     | Are used to play music, sound and narrations as they convert electrical impulses into sound   |
| <b>Network card</b> | Is used to connect the computer to a network  |
| <b>Printer</b>      | Is used to produce hard copy output, print information on paper   |
| <b>WiFi card</b>    | Allows you to connect your computer to a wireless network. In many situations WiFi has replaced conventional networks that use cable.   |
| <b>Bluetooth</b>    | Is standard that allows Bluetooth enabled devices to communicate over short distance using radio waves. using Bluetooth allows your cellphone and notebook to exchange data               |

## Computer Software

Software refers to the various programs & data used in a computer system that enable it perform a specific functions. Software instructs the computer on what to do and how to do it. All programs (software) are written using programming languages.

Software is generally divided into two main categories: System Software and Application Software. The system software are generally concerned with the various operations of a computer system and the application software are concerned with providing various services to the users



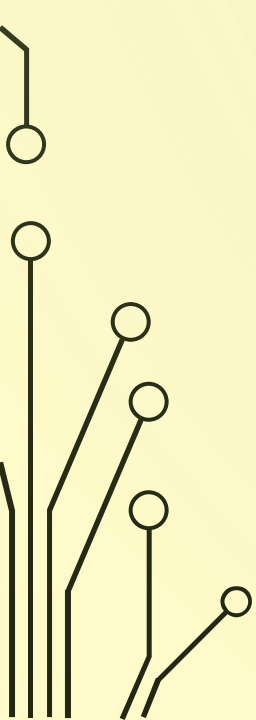
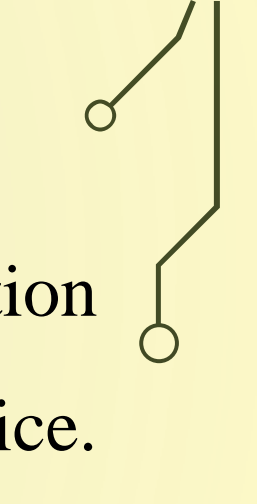
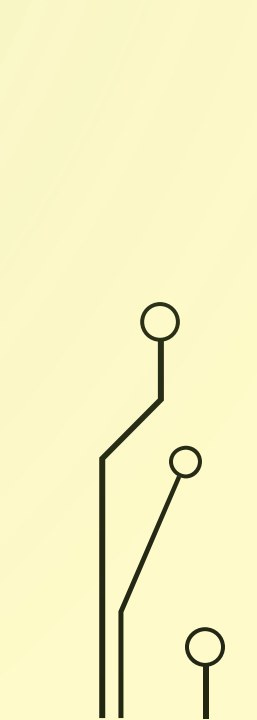


# **SYSTEMS SOFTWARE**

This is a set of programs, that controls the basic computer operation such as printing and the storage of data on secondary storage device.

An operating system is example of system software. They also enable users make efficient use of the computing facilities in order to solve their problems.

System software is further sub-classified as

- (a) Operating system.
  - (b) System utilities.
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# 1. OPERATING SYSTEMS

An Operating System is a set of programs designed to ensure the smooth running of the computer system. They are developed to manage all parts of the basic computer hardware & provide a more hospitable interface to users and their programs. It controls the way the way the software uses the hardware. This control ensures that the computer system operates in a systematic, reliable & efficient manner as intended by the user.

Examples of operating systems are:

- ✓ Microsoft windows
- ✓ Android
- ✓ Linux
- ✓ Apple operating system (MacOS & IOS)

## UTILITY SOFTWARE (Service programs).

- A Utility program is a program, which performs a generally useful task.
- Utility programs are used by end-users to perform many of the routine functions & operations such as, sorting, merging, program debugging, manage computer files, diagnose and repair computer problems that occur, etc. They are normally supplied the manufacturers to enable the computer to run more smoothly & efficiently.
- Most OS have many of the Utility programs needed to assist with the upkeep of the computer.

Some of the common Utility programs are those concerned with:

- **Searching.** They help to search for a file from one or more specified records. For example, in a Sales record, the *Search* facility assists in finding the salesperson with the highest sales.
- **Spell-checking** of words. After a document is typed, the words in the document are checked against those in a 'custom dictionary' in secondary storage. If any word used is not found in the dictionary, a warning is given indicating a possible spelling error

## APPLICATION SOFTWARE.

- ✓ Application programs are written to solve specific problems (or to handle the needs) of the end-user in particular areas.
- ✓ They interface between the user & system programs to allow the user to perform specific tasks.
- ✓ Application software helps to solve the problems of the computer user, and are therefore said to be *user-oriented*.
- ✓ They are designed specifically to carry out particular tasks. For example, they can be used to type & create professional documents, solve mathematical equations, draw pictures, etc.

Application software falls into 2 main categories/groups: -

- (i) General-purpose packages (Application packages).
- (ii) Special-purpose applications (User programs).

## General-purpose packages (Application packages)

They are usually pre-written programs made for non-specialists, in the home or business, and may be used for a wide variety of purposes.

They are off-shelf programs that are developed & supplied by manufacturers, Bureau & software companies at a price.

Examples: word processor, database, spreadsheet, PowerPoints

## Special-purpose applications (User-developed/ in-house programs)

They are written to meet the specific needs of an organization.

They are usually customized (modified/ tailored) programs written by the user or a Software house under contract, to perform a specific job.

They are developed by users to solve only the specific processing tasks in one organization, and may not suit the needs of other organizations, hence the name **In-house** or **Tailor-made programs**.

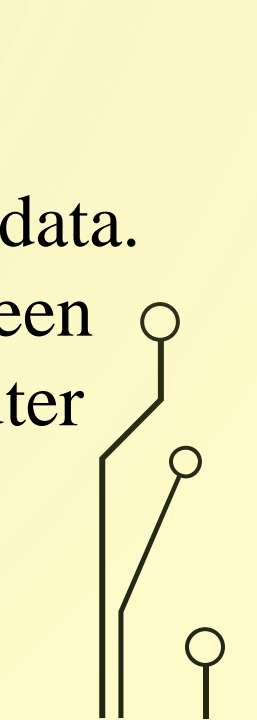

They are designed for a particular identifiable group of users such as Estate agents, farmers, Hoteliers, etc. e.g. point of sale, hospital management system



## Conclusion

ICT in particular entails to the use of electronic computers, communication devices and software applications to process information.

Information is processed data. Conversion of data to information entails inputting raw data, processing of the data by the computer and getting output from the data as information.



Computer systems have hardware and software for the processing of data. Hardware being the physical components of a computer that can be seen and touched. Software is a set of instructions that instructs the computer to do different tasks.

# Thank You

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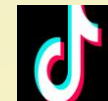
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